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A New Anaporrhutine Trematode (Fam. Gorgoderidae)
Nagmia yamagutia n. sp. from the Ovary of the
Ray, *Dasyatis uarnak*, from Bharat (India).

With 2 Text-figures

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ABSTRACT A new species *Nagmia yamagutia* is erected for these forms collected from the ovary of *Dasyatis uarnak*. The three specimens show many variations amongst themselves.

The first Anaporrhutine trematode of the family Gorgoderidae from this part of the world was described by Nagaty (1930) from the spiral valve of *Trygon* sp. from the Pear Banks of Ceylon, then a part of Bharat. After that no member of the subfamily has been reported so far. the various skates and rays of the Indian Ocean are common in the connected seas of the world. The worms were recovered along with Trypanorhynchid cestode larvae from the ovary of a preserved ray, *Dasyatis uarnak*, by one of my M. Sc. students, Mr. Kirti Singh in the practical class, to whom my thanks are due for the material. This fish has been reported from Cape of Good Hope, Natal, Madagascar, Zanzibar, Red Sea, Arabia, Andmans, Burma, Malaya and Siam, etc., besides the coasts of Bharat. The distribution of the fish and the parasites described from different parts of the world throw a light on the relationship of the parasites and the hosts of the groups, their distribution and evolution.

The three specimens show differences from the known species of the Genus *Nagmia* Nagaty, 1930, hence a new species *Nagmia yamagutia*, has been set up for them.

The species has been named in honour of the great Asian Helminthologist Prof. S. Yamaguti, the fruits of whose labours are enjoyed by all workers in this line today.

Nagmia yamagutia n. sp.

Three specimens were obtained in a preserved condition from the ovary of a

formalin-fixed ray, *Dasyatis uarnak*. The specimens are petaloid in shape with the posterior ends rounded in two and conical in the third. These are 11.6–13.5 mm long and 9.2–12 mm in the greatest width of the body. The terminal oral sucker is $0.85\text{--}1.2 \times 1.28\text{--}1.35$ mm with ventral mouth opening. The acetabulum may be larger or equal to the receptaculum seminis and measures $1.34\text{--}1.78 \times 1.72\text{--}1.95$ mm. The pharynx is more or less rounded. It overlaps the posterior part of the oral sucker and measures $0.65\text{--}0.76 \times 0.6\text{--}0.87$ mm. The oesophagus is small and 0.3–0.38 mm long. The intestinal caeca are branched irregularly all along their length and terminate 0.9–2 mm away from the posterior end and cover nearly $3/4$ of the body width.

The testes are follicular masses arranged in a regular manner, external to and very near the caeca. They may appear to be arranged in three or four linear groups. The follicles vary in their number not only on the right and left sides of the same specimen, but also in different specimens. There may be 37–41 follicles on the left

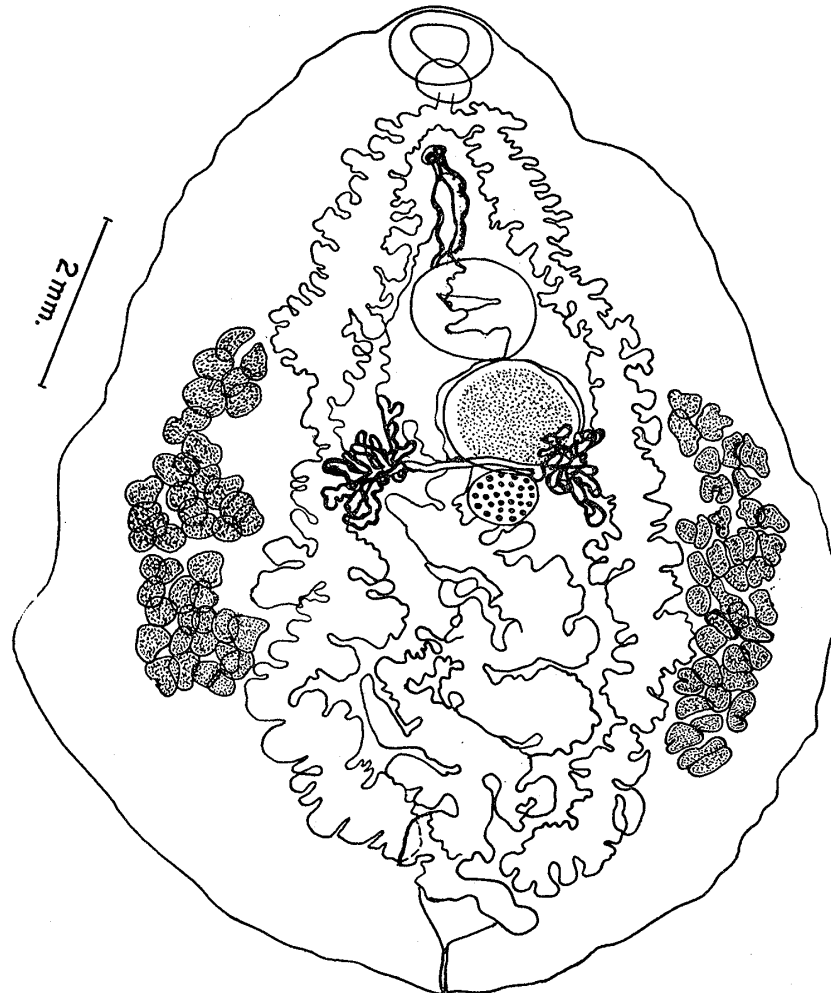


Fig. 1. *Nagmia yamagutia*, ventral view.

and 38–43 on the right side. The follicles may vary in shape from rounded to oval or multilobed masses of different shapes. Their extent also varies and they cover nearly half or slightly less than half of the body length, the right covering a greater length than the left. They extend anteriorly up to the level of the anterior margin of the acetabulum or may be post acetabular. The vasa efferentia from different follicles unite into larger ducts and finally unite to form the single vas deferens. This does not seem to be an important point of consideration, as emphasized by Markell (1953), as it appears to be a normal feature in trematodes when a large number of testes are present. The vas deferens forms, anterior to the acetabulum, the seminal vesicle 0.85–0.98 mm long, enclosed in a thin walled pouch, and it narrows anteriorly to form the ejaculatory duct to open to the outside through the male genital aperture, a little behind the intestinal bifurcation.

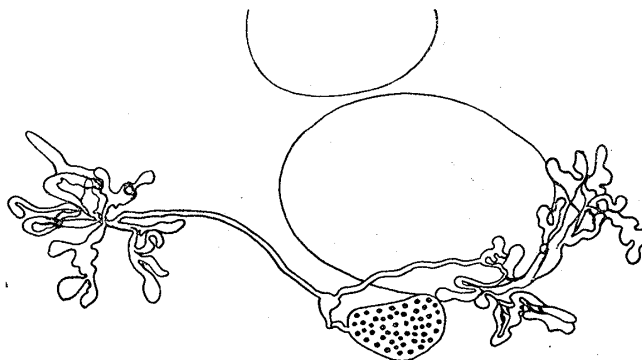


Fig. 2. *N. yamagutia*, another specimen to show only female reproductive complex.

The ovary is single, oval or more or less conical and measures $0.6\text{--}0.72 \times 0.75\text{--}1.1$ mm. It is situated just behind the receptaculum seminis, more towards the right side of the body and nearly in the middle of the body length. The receptaculum seminis present anterior to the ovary is quite large, rounded or oval and measures $1.55\text{--}2.45 \times 1.61\text{--}2.9$ mm. It is larger than the acetabulum in two specimens and smaller in the third (and in the other species of *Nagmia*). The vitelline glands lie internal to the intestinal caeca. The vitellaria of the right side may or may not overlap the ovary. The branching of the vitellaria is also variable, the branches may converge to a point in the center forming a cross of the main branches (Fig. 2), then give out 4 to 6 finger-like secondary branches from each branch, or may form long branches connected irregularly at one point (Fig. 1) or at different points (right side Fig. 2). The left measures $1.25\text{--}1.45 \times 1.45\text{--}1.7$ mm, while the right is $0.89\text{--}2.1 \times 0.76\text{--}2$ mm. The vitelline ducts of the two sides meet in the middle a little distance behind the receptaculum seminis. The uterine coils fill nearly the entire space between the caeca in the post-ovarian region and then run anteriorly on the left side anterior to the ovary to finally open by the side of the male genital aperture. The eggs are small, oval and operculated and embryonated and measure $0.06\text{--}0.075 \times 0.048\text{--}0.055$ mm (average 0.067×0.05 mm).

DISCUSSION

The present form differs from all the species of the genus *Nagmia* described so far, in several important characters. It differs from *Nagmia yorkei* Nagaty, 1930, in having a longer oesophagus, highly sacculated intestinal caeca, an oval or conical ovary, in the number and size of the testicular follicles, and their location very close to the intestinal caeca; in the nature and number of vitelline tubules, size of the different organs and of the egg, the eggs being embryonated in the present form.

It differs from *N. nebrii* Nagaty and Aal, 1961, in the shape of the intestinal caeca, the number and extent of the testicular follicles, their regular arrangement and location very near to the caeca, in the situation of the ovary posterior to the receptaculum seminis, in the position of the vitellaria, in the longer and extensive coils of the uterus filling the entire space between the caeca, and in the position of the genital pore.

N. yamagutia n. sp. differs from *N. rosettensis* in the shape of the ovary, the number, extent and position of the testicular follicles, the branching and position of the vitellaria, and the size of the different organs and the eggs.

It differs from *N. stegostomatis* in the shape of the intestinal caeca, position and number of testes, shape and position of the ovary, and the number and nature of the vitelline tubules.

N. floridensis and *N. pacifica* differ from *N. yamagutia* n. sp. in the size or presence of the oesophagus, respectively in the two, the nature of the intestinal sacculations, the shape and number of testicular follicles, and their arrangement, and the position and shape of the vitelline tubules.

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